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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/087,031	10/19/2001	James Vincent Crivello	0094046A	6505

7590 04/26/2004

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EXAMINER

ROBERTSON, JEFFREY

ART UNIT PAPER NUMBER

1712

DATE MAILED: 04/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

111

Office Action Summary	Application No.	Applicant(s)	
	10/087,031	CRIVELLO, JAMES VINCENT	
	Examiner	Art Unit	
	Jeffrey B. Robertson	1712	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-30 is/are pending in the application.
- 4a) Of the above claim(s) 28-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14 and 17-27 is/are rejected.
- 7) ☒ Claim(s) 15 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 14, and 17-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crivello (U.S. Patent No. 5,484,950, Crivello I) in view of Crivello et al. (Chem. Mater., 1997, 9, 1554-1561, Crivello II).

For claim 14, in column 3, lines 19-42, Crivello I teaches the selective hydrosilylation of a hydrosiloxane that falls within the definition set forth by applicant for the compound of formula I. In column 5, line 45 through column 6, line 20, Scheme A, Crivello I teaches a process where the compound of formula I is reacted sequentially with unsaturated compounds to form the final substituted product. For claims 17-24, in column 7, line 20 through column 8, line 38, Crivello I teaches that a vinyl containing epoxy compound, 3-vinyl-7-oxabicyclo[4.1.0] heptane (applicant's compound **A**), is reacted with 1,1,3,3-tetramethyldisiloxane to form a monohydrosiloxane of formula (II).

In column 9, line 50 through column 10, line 37, Crivello I teaches that this product is further reacted with vinyltrimethoxysilane (applicant's compound **B**). For claims 25 and 26, note that in column 8, Table 1, entries II and XIII, are derived from 1,1,3,3,5,5-hexamethyltrisiloxane and 1,1,3,3,5,5,7,7-octamethyltetrasiloxane, respectively. For

claim 27, in column 9, Table 1, in structure XVIII, Crivello I teaches an intermediate derived from methylphenylsilane.

Crivello I fails to teach that the reaction products are reacted with water in the presence of an ion exchange resin, and that the ion exchange resin is separated from the product of that reaction.

Crivello II, on page 1555, column 1, lines 38-43, teaches that epoxy-functional trimethoxysilanes are reacted in the presence of an ion exchange resin and 0.5-1.5 equivalents of water.

Crivello I and Crivello II are analogous art in that they both teach silicon based compounds containing both epoxy groups and silicon-alkoxy groups. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the products of Crivello I in the condensations of Crivello II. The motivation would have been that Crivello I, in column 1, lines 37-41 and column 2, lines 60-63, sets forth that the compounds produced in the patent are useful for synthesis of oligomers, where the compounds have two different functional groups. The silanes of Crivello II have both epoxy and alkoxy-silicon groups as produced in Crivello I. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Response to Arguments

3. Applicant's arguments filed 1/26/04 have been fully considered but they are not persuasive. Applicant argues that there is no motivation for applying the monomers of

Crivello I in the process of polymerization of Crivello II. Applicant also argues that there are unexpected advantages from the use of the claimed starting materials over the starting materials used in Crivello II. Specifically, applicant points to the increased conversion rates of the claimed monomers as compared to the monomers set forth by Crivello II and the toughness and flexibility of the resulting films in view of the difference of closest analogs. Applicant appears to argue that the difference of a $-\text{CH}_2\text{CH}_2\text{-Si-O-Si}$ linkage is not significant and one would not expect a significant change in properties with the inclusion of this linkage. Applicant argues that this is surprising and amounts to a discontinuity between the polymers resulting from the monomers of Crivello II and the claimed monomers, which correspond to Crivello I.

In response to applicant's argument that there is no motivation to apply the process of Crivello II to the epoxy-containing monomers of Crivello I, the examiner disagrees. Crivello I states that the products are useful to prepare oligomers and polymers. One of ordinary skill in the art would have turned to Crivello II in order to find a suitable polymerization process for epoxy and alkoxy containing silicon compounds. On page 1556, column 2, first full paragraph of Crivello II, it is stated that the use of the sol gel systems is advantageous for condensation to provide for a convenient reactions and reproducible molecular weight control. Here, Crivello II also states that this method is widely applicable for tailor-made siloxanes with polymerizable functional groups.

Therefore, the examiner's position is that there is sufficient motivation to apply the procedures taught in Crivello II to the products of Crivello I.

Applicant also argues that there are unexpected results in the use of the claimed products corresponding to Crivello I as compared to the compounds used Crivello II. Applicant points to page 22, [0053] of the instant specification as showing the lower conversions of the polymers derived from the monomers corresponding to those of Crivello II versus the polymers derived from the claimed products of the instant application. However, from the discussion in this part of the specification, it appears that contrary to applicant's arguments, such differences in conversion and in properties of the resulting polymers would have been expected. For example it is stated in referring to the polymers derived from monomers similar to those set forth in Crivello II that "[d]iffusion and mobility of the bulky epoxycyclohexyl groups in such a polymer *would be expected* to be restricted resulting in vitrification of the polymer at low conversion." [emphasis added] In referring to the polymers derived from the monomers claimed herein, it is stated, "high mobility of the other resins with flexible siloxane groups in the spacers gives rise to much higher conversions due to suppression of the onset of vitrification." Therefore, while the examiner acknowledges that there are differences in the polymers produced from the different monomers, there is no evidence that such differences would have been unexpected. Contrary to applicant's arguments regarding the difference of a $-\text{CH}_2\text{CH}_2-\text{Si}-\text{O}-\text{Si}-$ linkage, this difference would not have been expected to be trivial, but would have been expected to give rise to the improvements seen in the resulting polymers. Therefore, the rejection is continued.

Allowable Subject Matter

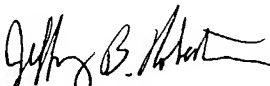
4. Claims 15 and 16 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. Neither reference cited above teaches or suggests the use of an additional silane of the formula set forth by applicant in the process.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey B. Robertson whose telephone number is (571) 272-1092. The examiner can normally be reached on Mon-Fri 7:00-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JBR


Jeffrey B. Robertson
Primary Examiner
Art Unit 1712